U.S. Patent No. 6,132,851

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A v rsion of th abov amended claims marked to indicate the specific amendments may be found in the attached Appendix, in accordance with 37 CFR 1.121(c)(1).

REMARKS

Patentee respectfully requests correction of U.S. Patent No. 6,132,851 as shown and for the reasons set forth herein.

The structure shown for the difunctional epoxy resin (B-1) represented as Formula (II) at column 3, line 1 and in dependent claim 4 at column 10, line 8 in the above-identified U.S. Patent 6,132,851 (the "Patent") is erroneous. The erroneous structure in the Patent is shown as follows.

$$H_2C \underbrace{\hspace{1cm} CH-CH_2}_{CH-CH_2} \underbrace{\hspace{1cm} CH-CH_2}_{R_2} \underbrace{\hspace{1cm} CH-CH_2}_{HO} \underbrace{\hspace{1cm} CH-CH_2}_{n} \underbrace{\hspace{1cm} CH-CH_2}_{R_2} \underbrace{\hspace{1cm} CH-CH_2}_{n} \underbrace{\hspace{1cm} CH-CH_2}_{R_2} \underbrace{\hspace{1cm} CH-CH_2}_{n} \underbrace$$

The correct structure for Formula (II), which differs by the insertion of four phenylene rings in the structure, is as follows.

$$\mathsf{H}_2\mathsf{C} \underbrace{\mathsf{CH}}_2\mathsf{CH}_2$$

Support for the correct Formula (II) is in the specification as originally filed as follows. First, the specification at column 3, lines 19 - 25 provides examples of commercially available diffunctional epoxy resins including DER 661, DER 664 and DER 667 (each a product of Dow Chemical Company). Each product is identified as having

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Chemical Abstracts Service (CAS) registry number 25036-25-3.¹ CAS defines this compound as Phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis- (4,1-phenyleneoxymethylene)]bis[oxirane].² The correct structural formula for this compound is depicted by the correct Formula (II) shown above. For this reason alone, the correction of Formula (II) to that shown above is fully supported and defined by the specification, as would be understood by a person of skill in the art.

Second, the specification at column 3, lines 14-15 provides examples of compounds represented by the difunctional epoxy resin including bisphenol A (2,2-bis(hydroxyphenyl)propane), bisphenol F (bis(4-hydroxyphenyl)methane) and bisphenol AD (1,1-bis(4-hydroxyphenyl)ethane). Each is respectively represented by the following formulae.

$$HO \longrightarrow CH_3$$
 CH_3 CH

A generic bisphenol is thus represented by the following formula.

$$R_1$$

In a two step reaction, bisphenol and an epoxy liquid resin such as 2-(chloromethyl)oxirane react to form the formula identified by CAS number 25036-25-3.3

¹ See Exhibit 1 which identifies product information for DER 661, DER 664 and DER 667.

² See Exhibit 2 which identifies CAS # 25036-25-3.

³ See Exhibit 3 from Irina Averkieff, Epoxy Resins in Stone Consolidation 13-15 (1992).

The above reaction sequence and the difunctional epoxy resin product are well known in the art. See, for example: U.S. Patent No. 6,248,401 column 10, line 60 to column 11, line 26; U.S. Patent No. 5,709,957 column 10, line 56 to column 11, line 20; U.S. Patent No. 5,629,098 column 2, line 47 to column 3, line 17; and U.S. Patent No. 5,525,433 column 2, line 47 to column 3, line 17; each of which similarly describes the difunctional epoxy resin and depicts the correct structural formula that should properly be represented by Formula (II) in the Patent. The specification therefore describes, identifies and provides full support for the corrected Formula (II). One skilled in the art could only identify the corrected formula as provided by this amendment.

Patentee submits that the original formula was drawn in error. In the original application at page 4, line 1 and page 15 line 23, it may be noted that the simple atoms within the formula were typed and that bonded regions were hand drawn. There are four unusually large spaces (in the incorrect formula represented as carbon-oxygen bonds) where phenylene rings should have been hand-drawn but were not, thus leading to the incorrect Formula (II). It if had been intended to draw the structure without the phenylene rings, no such extended ether "bonds" would have been shown in the original, incorrect structure since each "...O----C----O..." portion would have been represented in the formula simply as "...OCO...". Patentee therefore submits that the application shows four areas in which four phenylene rings were to be hand-drawn and were inadvertently omitted. If the rings were inserted in each of these positions, the

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structure would have been represented as the correct Formula (II) and properly supported by the specification.

For these reasons, Patentee respectfully submits that the corrected formula is supported by the original specification, that only the corrected formula comports with the description in the specification and that the formula as it is currently represented is plainly incorrect. For the reasons set forth herein, the amendment is not new matter. Applicant requests that a reissue patent be granted incorporating the foregoing correction.

Respectfully submitted,
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